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(e) EPA will monitor the aggregate results of spot check testing and full environmental test cells. If EPA determines, based on such aggregate results, that any simulation (other than the AC1 and AC2 procedures described in paragraphs (b) and (c) of this section for the 2000, 2001, and 2002 model years) is producing test results consistently below those from a full environmental test cell, EPA may review its approval of the simulation.

[61 FR 54899, Oct. 22, 1996]

§ 86.164-00 Supplemental Federal Test Procedure calculations.

(a) The provisions of § 86.144-94 (b) and (c) are applicable to this section except that the NO_x humidity correction factor of § 86.144-94(c)(7)(iv) must be modified when adjusting SC03 environmental test cell NO_x results to 100 grains of water (see paragraph (d) of this section). These provisions provide the procedures for calculating mass emission results of each regulated exhaust pollutant for the test schedules of FTP, US06, and SC03.

(b) The provisions of § 86.144-94(a) are applicable to this section. These provisions provide the procedures for determining the weighted mass emissions for the FTP test schedule (Y_{wm}).

(c)(1) When the test vehicle is equipped with air conditioning, the final reported test results for the SFTP composite (NMHC+NO_x) and optional composite CO standards shall be computed by the following formulas.

$$(i) Y_{WSFTP} = 0.35(Y_{FTP}) + 0.37(Y_{SC03}) + 0.28(Y_{US06})$$

Where:

(A) Y_{WSFTP} = Mass emissions per mile for a particular pollutant weighted in terms of the contributions from the FTP, SC03, and US06 schedules. Values of Y_{WSFTP} are obtained for each of the exhaust emissions of NMHC, NO_x, and CO.

(B) Y_{FTP} = Weighted mass emissions per mile (Y_{wm}) based on the measured driving distance of the FTP test schedule.

(C) Y_{SC03} = Calculated mass emissions per mile based on the measured driving distance of the SC03 test schedule.

(D) Y_{US06} = Calculated mass emissions per mile based on the measured driving distance of the US06 test schedule.

$$(ii) \text{ Composite (NMHC+NO}_x\text{)} = Y_{WSFTP}(\text{NMHC}) + Y_{WSFTP}(\text{NO}_x)$$

Where:

(A) Y_{WSFTP}(NMHC)=results of paragraph (c)(1)(i) of this section for NMHC.

(B) Y_{WSFTP}(NO_x)=results of paragraph (c)(1)(i) of this section for NO_x.

(2) When the test vehicle is not equipped with air conditioning, the relationship of paragraph (c)(1)(i) of this section is:

$$(i) Y_{WSFTP} = 0.72(Y_{FTP}) + 0.28(Y_{US06})$$

Where:

(A) Y_{WSFTP} = Mass emissions per mile for a particular pollutant weighted in terms of the contributions from the FTP and US06 schedules. Values of Y_{WSFTP} are obtained for each of the exhaust emissions of NMHC, NO_x, and CO.

(B) Y_{FTP} = Weighted mass emissions per mile (Y_{wm}) based on the measured driving distance of the FTP test schedule.

(C) Y_{US06} = Calculated mass emissions per mile based on the measured driving distance of the US06 test schedule.

$$(ii) \text{ Composite (NMHC+NO}_x\text{)} = Y_{WSFTP}(\text{NMHC}) + Y_{WSFTP}(\text{NO}_x)$$

Where:

(A) Y_{WSFTP}(NMHC)=results of paragraph (c)(2)(i) of this section for NMHC.

(B) Y_{WSFTP}(NO_x)=results of paragraph (c)(2)(i) of this section for NO_x.

(d) The NO_x humidity correction factor for adjusting NO_x test results to the environmental test cell air conditioning ambient condition of 100 grains of water/pound of dry air is:

$$K_H (100) = 0.8825 / [1 - 0.0047(H - 75)]$$

Where:

H=measured test humidity in grains of water/pound of dry air.

[61 FR 54900, Oct. 22, 1996, as amended at 70 FR 40434, July 13, 2005]

§ 86.164-08 Supplemental Federal Test Procedure calculations.

(a) The provisions of § 86.144-94 (b) and (c) are applicable to this section except that the NO_x humidity correction factor of § 86.144-94(c)(7)(iv) must be modified when adjusting SC03 environmental test cell NO_x results to 100 grains of water according to paragraph

(d) of this section. These provisions provide the procedures for calculating mass emission results of each regulated exhaust pollutant for the test schedules of FTP, US06, and SC03.

(b) The provisions of § 86.144-94(a) are applicable to this section. These provisions provide the procedures for determining the weighted mass emissions for the FTP test schedule (Y_{wm}).

(c)(1) When the test vehicle is equipped with air conditioning, the final reported test results for the SFTP composite (NMHC+NO_x) and optional composite CO standards shall be computed by the following formulas.

$$(i) Y_{WSFTP} = 0.35(Y_{FTP}) + 0.37(Y_{SC03}) + 0.28(Y_{US06})$$

Where:

(A) Y_{WSFTP} = Mass emissions per mile for a particular pollutant weighted in terms of the contributions from the FTP, SC03, and US06 schedules. Values of Y_{WSFTP} are obtained for each of the exhaust emissions of NMHC, NO_x and CO.

(B) Y_{FTP} = Weighted mass emissions per mile (Y_{wm}) based on the measured driving distance of the FTP test schedule.

(C) Y_{SC03} = Calculated mass emissions per mile based on the measured driving distance of the SC03 test schedule.

(D)(1) Y_{US06} = Calculated mass emissions per mile based on the measured driving distance of the US06 test schedule; or,

(2) In the case of a 2-phase US06 test run according to the provisions of § 86.159-08(f)(2) and part 600 of this chapter:

Y_{US06} = Calculated mass emissions per mile, using the summed mass emissions of the "US06 City" phase and the "US06 Highway" phase, based on the measured driving distance of the US06 test schedule. The "US06 City" phase shall be sampled during seconds 0-130 and from 495 seconds until five seconds after the engine stops running (*e.g.* 602 or 603 seconds) of the US06 driving schedule. The "US06 Highway" phase shall be sampled during seconds 130-495 of the US06 driving schedule).

$$(ii) \text{ Composite (NMHC+NO}_x\text{)} = Y_{WSFTP}(\text{NMHC}) + Y_{WSFTP}(\text{NO}_x)$$

Where:

(A) $Y_{WSFTP}(\text{NMHC})$ = results of paragraph (c)(1)(i) of this section for NMHC.

(B) $Y_{WSFTP}(\text{NO}_x)$ = results of paragraph (c)(1)(i) of this section for NO_x.

(2) When the test vehicle is not equipped with air conditioning, the final reported test results for the SFTP composite (NMHC+NO_x) and optional composite CO standards shall be computed by the following formulas.

$$(i) Y_{WSFTP} = 0.72(Y_{FTP}) + 0.28(Y_{US06})$$

Where:

(A) Y_{WSFTP} = Mass emissions per mile for a particular pollutant weighted in terms of the contributions from the FTP and US06 schedules. Values of Y_{WSFTP} are obtained for each of the exhaust emissions of NMHC, NO_x and CO.

(B) Y_{FTP} = Weighted mass emissions per mile (Y_{wm}) based on the measured driving distance of the FTP test schedule.

(C)(1) Y_{US06} = Calculated mass emissions per mile based on the measured driving distance of the US06 test schedule; or,

(2) In the case of a 2-phase US06 test run according to the provisions of § 86.159-08(f)(2) and part 600 of this chapter:

Y_{US06} = Calculated mass emissions per mile, using the summed mass emissions of the "US06 City" phase and the "US06 Highway" phase, based on the measured driving distance of the US06 test schedule. The "US06 City" phase shall be sampled during seconds 0-130 and from 495 seconds until five seconds after the engine stops running (*e.g.* 602 or 603 seconds) of the US06 driving schedule. The "US06 Highway" phase shall be sampled during seconds 130-495 of the US06 driving schedule).

$$(ii) \text{ Composite (NMHC+NO}_x\text{)} = Y_{WSFTP}(\text{NMHC}) + Y_{WSFTP}(\text{NO}_x)$$

Where:

(A) $Y_{WSFTP}(\text{NMHC})$ = results of paragraph (c)(2)(i) of this section for NMHC.

(B) $Y_{WSFTP}(\text{NO}_x)$ = results of paragraph (c)(2)(i) of this section for NO_x.

(d) The NO_x humidity correction factor for adjusting NO_x test results to the environmental test cell air conditioning ambient condition of 100 grains of water/pound of dry air is:

$$K_H(100) = 0.8825/[1 - 0.0047(H - 75)]$$

Where:

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H = measured test humidity in grains of water/pound of dry air.

[71 FR 77922, Dec. 27, 2006, as amended at 74 FR 61548, Nov. 25, 2009]

§ 86.165–12 Air conditioning idle test procedure.

(a) *Applicability.* This section describes procedures for determining air conditioning-related CO₂ emissions from light-duty vehicles, light-duty trucks, and medium-duty passenger vehicles. The results of this test are used to qualify for air conditioning efficiency CO₂ credits according to § 86.1866–12(c).

(b) *Overview.* The test consists of a brief period to stabilize the vehicle at idle, followed by a ten-minute period at idle when CO₂ emissions are measured without any air conditioning systems operating, followed by a ten-minute period at idle when CO₂ emissions are measured with the air conditioning system operating. This test is designed to determine the air conditioning-related CO₂ emission value, in grams per minute. If engine stalling occurs during cycle operation, follow the provisions of § 86.136–90 to restart the test. Measurement instruments must meet the specifications described in this subpart.

(c) *Test cell ambient conditions.* (1) Ambient humidity within the test cell during all phases of the test sequence shall be controlled to an average of 40–60 grains of water/pound of dry air.

(2) Ambient air temperature within the test cell during all phases of the test sequence shall be controlled to 73–80 °F on average and 75 ± 5 °F as an instantaneous measurement. Air temperature shall be recorded continuously at intervals of not more than 30 seconds.

(d) *Test sequence.* (1) Connect the vehicle exhaust system to the raw sampling location or dilution stage according to the provisions of this subpart. For dilution systems, dilute the exhaust as described in this subpart. Continuous sampling systems must meet the specifications provided in this subpart.

(2) Test the vehicle in a fully warmed-up condition. If the vehicle has soaked for two hours or less since the last exhaust test element, preconditioning

may consist of a 505 Cycle, 866 Cycle, US06, or SC03, as these terms are defined in § 86.1803–01, or a highway fuel economy test procedure, as defined in § 600.002–08 of this chapter. For soak periods longer than two hours, precondition the vehicle using one full Urban Dynamometer Driving Schedule. Ensure that the vehicle has stabilized at test cell ambient conditions such that the vehicle interior temperature is not substantially different from the external test cell temperature. Windows may be opened during preconditioning to achieve this stabilization.

(3) Immediately after the preconditioning, turn off any cooling fans, if present, close the vehicle's hood, fully close all the vehicle's windows, ensure that all the vehicle's air conditioning systems are set to full off, start the CO₂ sampling system, and then idle the vehicle for not less than 1 minute and not more than 5 minutes to achieve normal and stable idle operation.

(4) Measure and record the continuous CO₂ concentration for 600 seconds. Measure the CO₂ concentration continuously using raw or dilute sampling procedures. Multiply this concentration by the continuous (raw or dilute) flow rate at the emission sampling location to determine the CO₂ flow rate. Calculate the CO₂ cumulative flow rate continuously over the test interval. This cumulative value is the total mass of the emitted CO₂. Alternatively, CO₂ may be measured and recorded using a constant velocity sampling system as described in §§ 86.106–96(a)(2) and 86.109.

(5) Within 60 seconds after completing the measurement described in paragraph (d)(4) of this section, turn on the vehicle's air conditioning system. Set automatic air conditioning systems to a temperature 9 °F (5 °C) below the ambient temperature of the test cell. Set manual air conditioning systems to maximum cooling with recirculation turned off, except that recirculation shall be enabled if the air conditioning system automatically defaults to a recirculation mode when set to maximum cooling. Continue idling the vehicle while measuring and recording the continuous CO₂ concentration for 600 seconds as described in paragraph (d)(4) of this section. Air